

Von den Anforderungen zum Modell

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Übersicht



- Ausgangssituation
- Ontologien
 - Entitäten und Klassen
 - Properties und Relationen
- Anwendungsprofile
 - Standards
 - ASCH APs

Göttingen Royal Academic Museum, 1773

In 7 Schritten zum Modell

1. Empirische Erhebung, Datenanalyse, Datenevaluation
2. Formulierung von Anwendungsfällen (use cases)
3. Analyse der Anforderungen (requirements)
4. Identifizierung der Entitäten und definieren von Klassen
5. Identifizierung von Eigenschaften (properties) und Beziehungen
6. Entwicklung von Anwendungsprofilen
7. Test des Datenmodells

	Scenario	Actor	Goal	Requirement ID	Requirement
Scenarios related to information about the event/activities the items of a collection were involved					
Scenario 22	A user needs information about all events in the lifecycle of an item during a certain time span.	user	Find events related to an item during a certain time span	[Requirement 20]	Item descriptions must be interlinked with 1-n events (creation, modification, collection, etc.) in the lifecycle of the item.
				[Requirement 27]	An event in the lifecycle of an item must be related to 0-n date information.
Scenario 23	A user needs information about items that were present during an event (e.g. collected items, used items, created items, etc.).	user	Find items related to a certain event.	[Requirement 23]	An event in the lifecycle of an item must be related to 1-n items.
Scenario 24	A user is searching for items of the same price related to acquisition events.	user	Find events of the same type having statements with similar values	[Requirement 20]	Item descriptions must be interlinked with 1-n events (creation, modification, collection, etc.) in the lifecycle of the item.
				[Requirement 8]	The nature of a resource must be described using 1-n controlled values.
				[Requirement 1]	Resource descriptions must be machine readable.
Scenario 25	A user wants to know where an event happened.	user	Find places related to an event	[Requirement 26]	An event in the lifecycle of an item must be related to 0-n places.
				[Requirement 39]	Places must be identified by identifiers that are unique, machine readable and persistent.
				[Requirement 41]	Place descriptions can include 1-n place appellations
Scenario 26	A user wants to know more about places related to an item.	user	Get information about places related to a certain item.	[Requirement 9]	Resources can be interlinked with 0 - n other resources.
				[Requirement 3]	A resource description must provide all attributes necessary to identify the resource and distinguish it from other resources of the same type.
Scenario 27	A user is searching for items that have been collected in a certain area.	user	Find items related to the same type of events happening at a certain place.	[Requirement 20]	Item descriptions must be interlinked with 1-n events (creation, modification, collection, etc.) in the lifecycle of the item.
				[Requirement 22]	Event descriptions must show the nature of the relation between items, agents, places and/or time.
				[Requirement 26]	An event in the lifecycle of an item must be related to 0-n places.
				[Requirement 40]	Places must be identified by machine readable geo-information / geographic coordinates

Ausgangssituation

- Ziel: ein Modell zur Beschreibung von Provenienz
 - das für verschiedene Arten von Objekten genutzt werden kann,
 - das die Nachnutzung der Daten in unterschiedlichen Kontexten ermöglicht (z. B. übergreifendes Kulturportal vs. domainspezifische Portale)
- Interoperabilität durch Nachnutzung vorhandener Standards
 - Einheitlicher Standard zur Beschreibung der Provenienz
 - Heterogene Beschreibung der Objekte
- Anforderungen (requirements) ergeben
 - Relevante Entitäten
 - Relevante Beziehungen
 - Relevanz weiterer Aussagen



Personen

Digitalisate

Körperschaften

Ereignisse

Objekte

Zeit

Sammlungen

Orte

Namen/Bezeichnungen

Konzepte

Erscheinungsbild

Aussagen



Entitäten -> Klassen

- „An entity is something that exists as itself, as a subject or an object, actually or potentially, concretely or abstractly, physically or not. It need not be of material existence.“

<https://en.wikipedia.org/wiki/Entity>

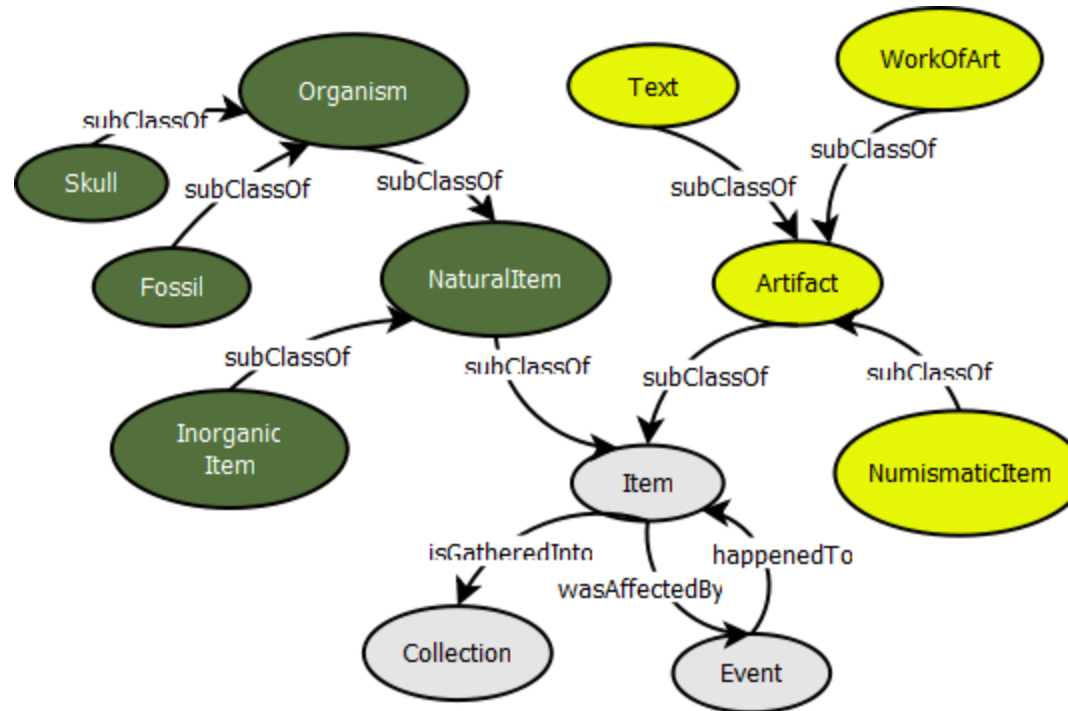
- Classes
 - **Event** = Something that happened and affected the lifecycle of the resource.
 - **Agent** = A person, organization or group that acts or may act.
 - **Place** = A geographic location.
 - **Time** = A resource representing a point in time.
 - **Item** = A real world thing.
 - **Digital Representation** = A digital resource used as a proxy for a real-world-thing in a digital environment.
 - **Collection** = An aggregation of items.
 - **Appearance** = The physical characteristics of an item.
 - **Concept** = Controlled values representing an idea or a unit of thought.
 - **Statement** = A triple of an object, a predicate and a subject describing a feature of a resource.
 - **Appellation** = The name of an entity.

Classes -> Subclasses

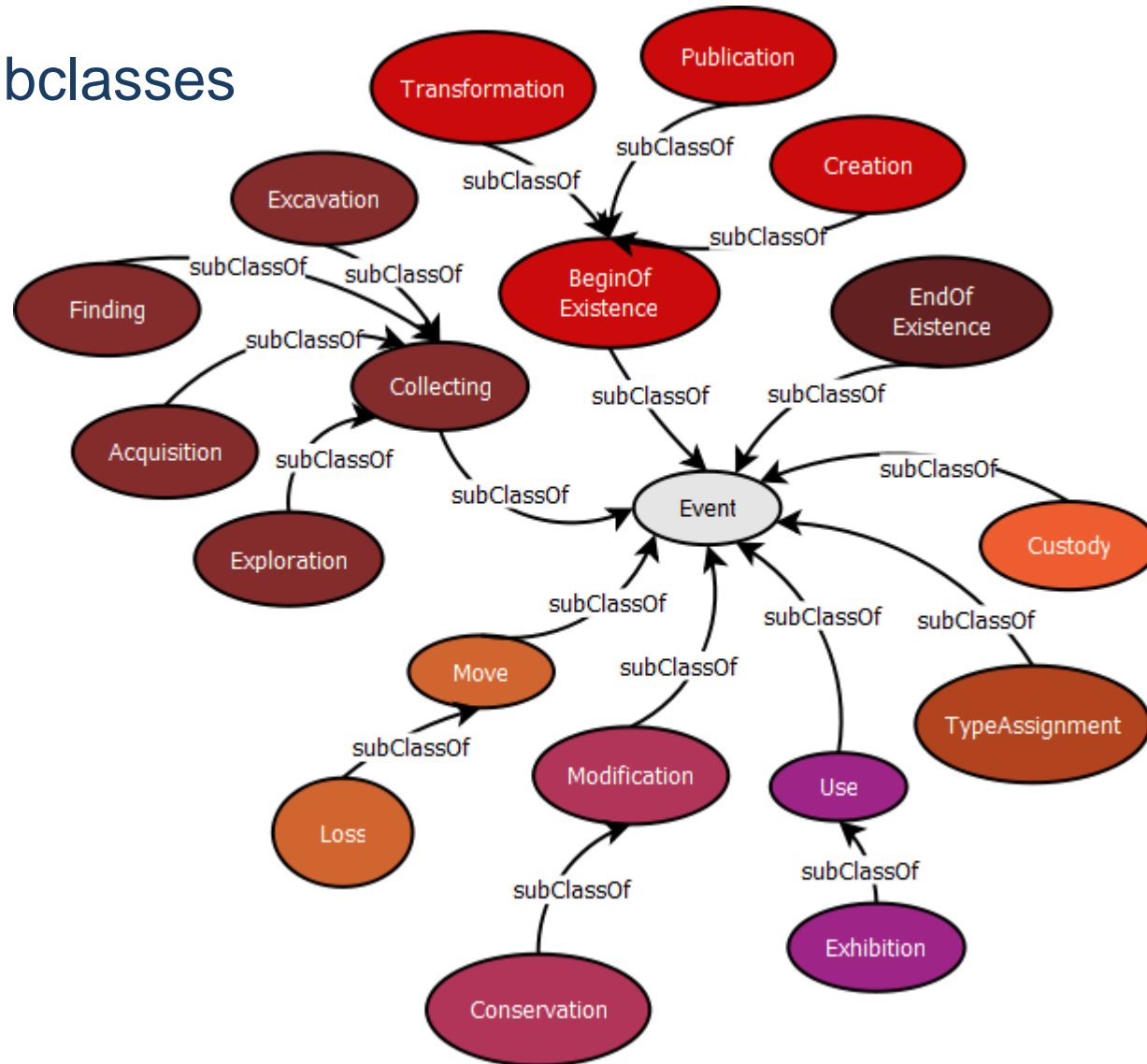
- Item = A real world thing.
 - Artifact = Something created by humans.
 - Text = A resource consisting primarily of words for reading.
 - Work of Art = Outcome of an artistic creation process.
 - Numismatic Item = A thing used as money in the present, past or future.
 - Natural Item = Something that occurs in nature and is not made by humans.
 - Organism = Natural item living or having lived as a human, animal, plant etc.
 - Skull = Bones of the head.
 - Fossil = Remains of a humans, animals or plants.
 - Inorganic Item = Natural substance like minerals, rocks or other objects alike.



Item Subclasses



Event Subclasses





Beziehungen zwischen den Entitäten

Beschreibung der Provenienz

- Event **happened to** Item
- Event **has type** Concept
- Event **is part of** Event
- Event **took place** at Place
- Event **has participant** Agent
- Event **has start** Time
- Event **has end** Time

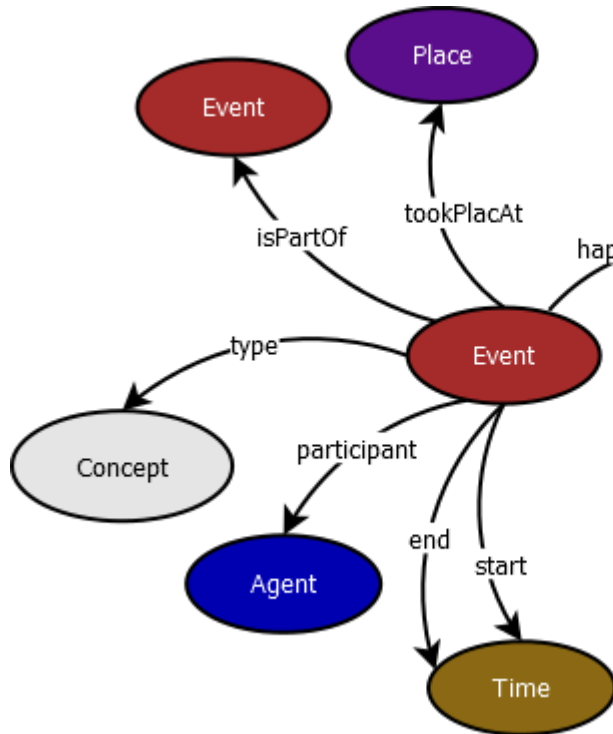
Beschreibung der Objekte

- Item **was affected by** Event
- Item **has type** Concept
- Item **is part of** Item
- Item **is gathered into** Collection
- Item **has appellation** Appellation
- Item **has digital representation** Digital Representation
- Item **has physical description** Appearance

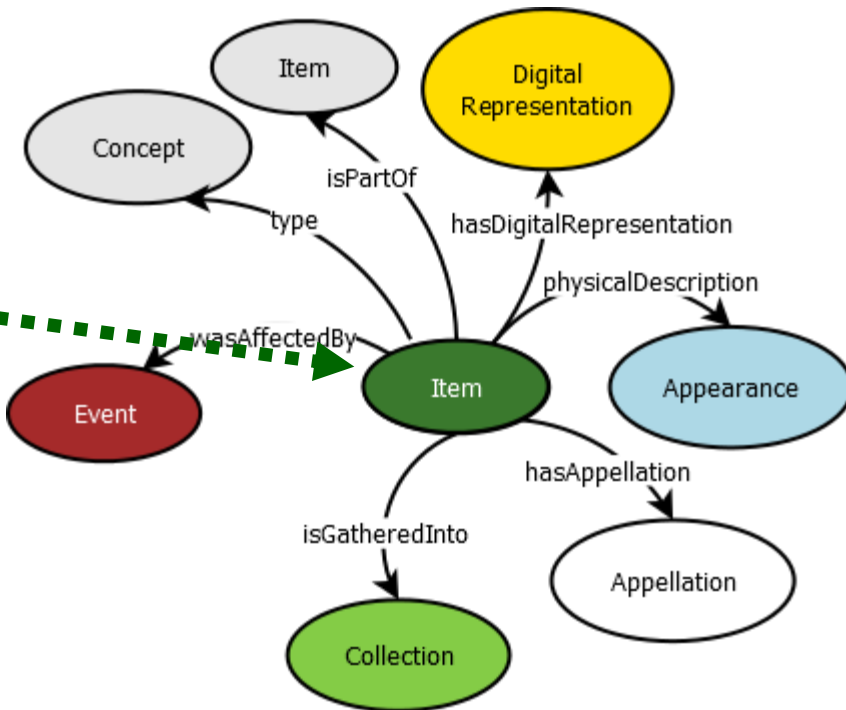
- Domain Model zur Beschreibung von Provenienzen ➡ **Provenance Description Ontology**
- Domain Model zur Beschreibung von Objekten ➡ **Item Description Ontology**

Entitäten und Beziehungen

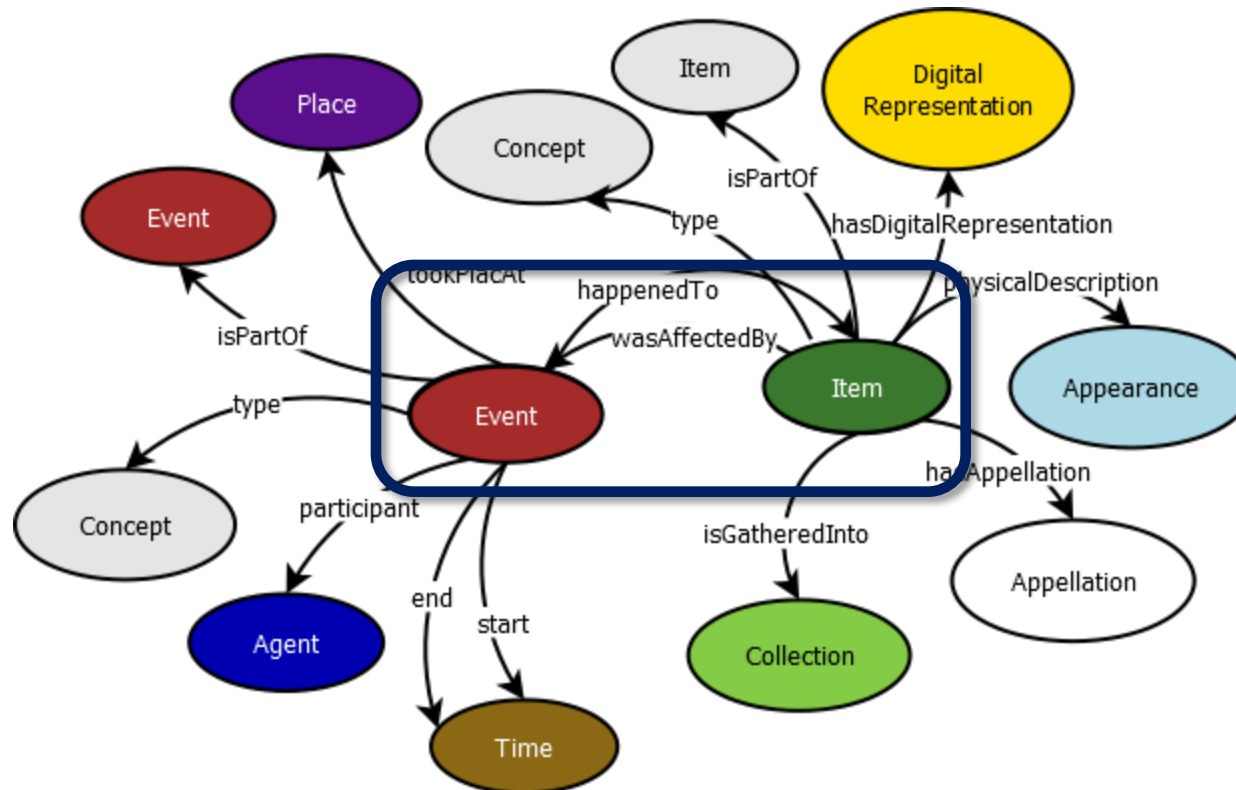
- Provenance Description Ontology



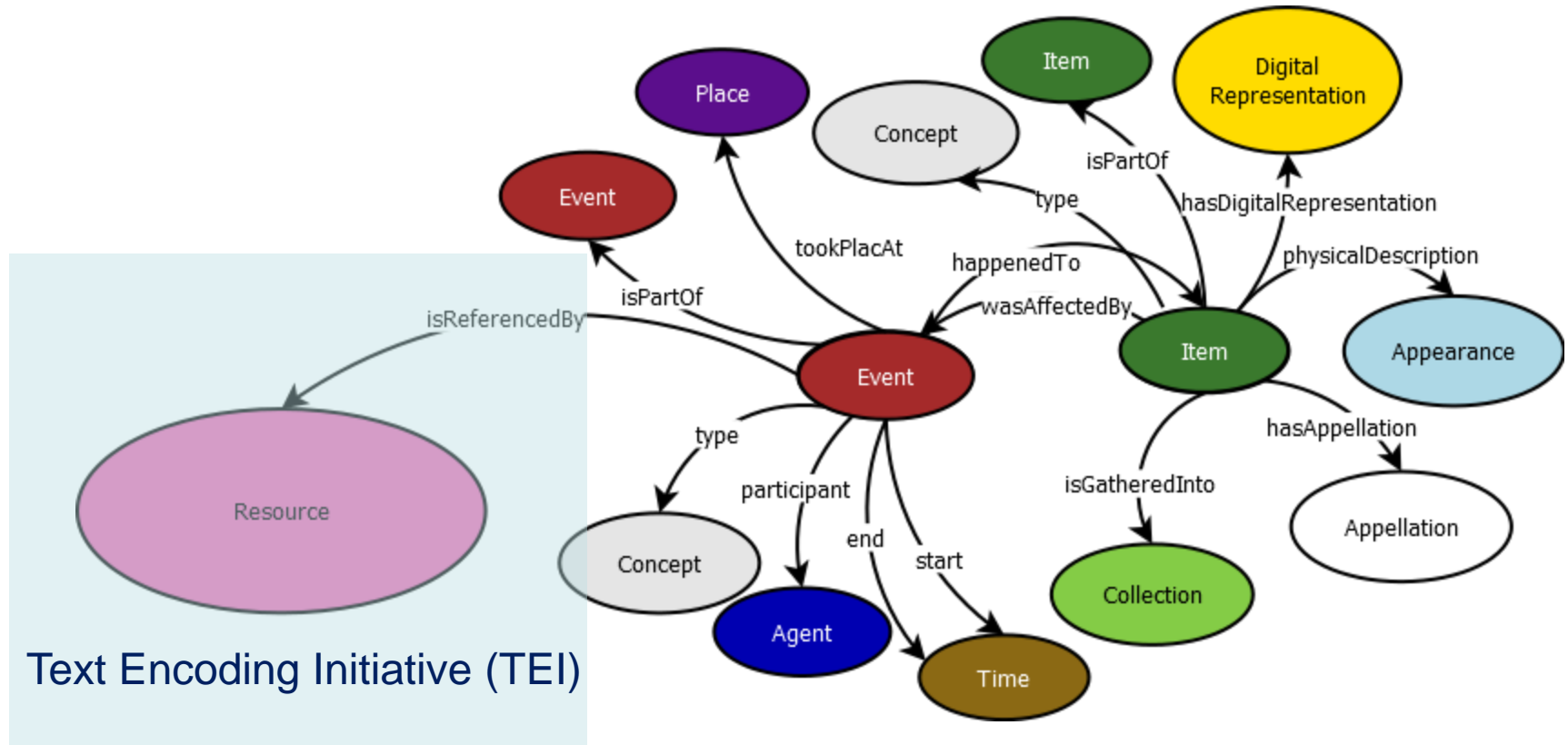
- Item Description Ontology



Entitäten und Beziehungen



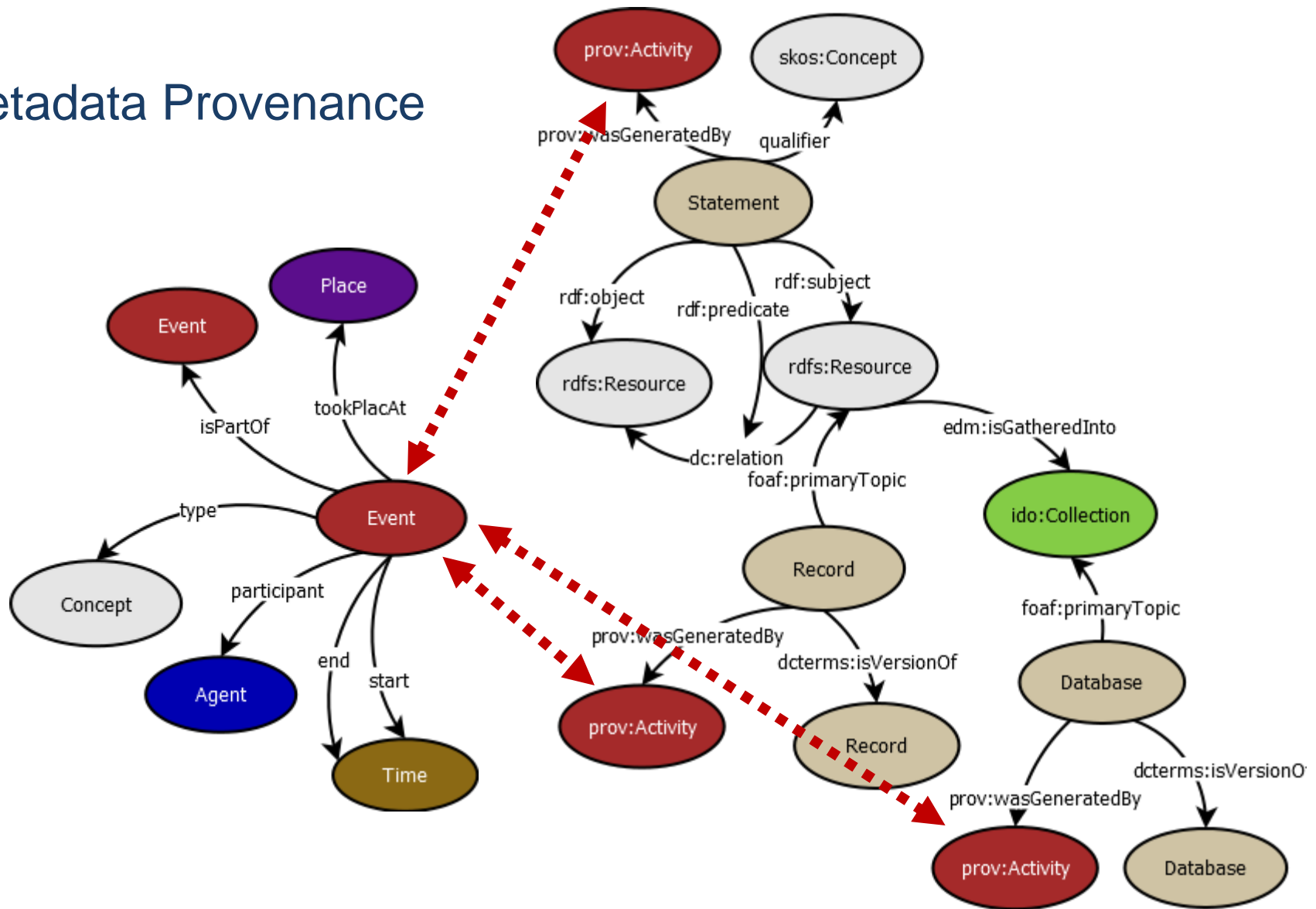
Beziehung zwischen Events und Evidenzen



Metadata Provenienz

- Entities
 - **Database** = A collection of data.
 - **Record** = An entity in a catalog, describing a single resource.
 - **Statement** = A triple of an object, a predicate and a subject describing a feature of a resource.
 - **prov:Activity** = Something that occurs over a period of time and acts upon or with entities.
- Relationen
 - Statement **was generated by** prov:Activity
 - Record **was generated by** prov:Activity
 - Database **was generated by** prov:Activity

Metadata Provenance



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NTT docomo

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- Metadatenstandards sind Voraussetzung für eine anwendungsübergreifende einheitliche Beschreibung
- „Different types of resources require different types of metadata and metadata standards“
(http://wiki.dublincore.org/index.php/User_Guide)

Standards

- Dublin Core
 - <http://dublincore.org/documents/dces/> (dc)
 - <http://dublincore.org/documents/dcml-terms/> (dcterms)
- Europeana Data model (edm)
 - <https://pro.europeana.eu/page/edm-documentation>
- The PROV Ontology (prov)
 - <https://www.w3.org/TR/2013/REC-prov-o-20130430/>
- CIDOC Conceptual Reference Model (crm)
 - <http://cidoc-crm.org/get-last-official-release>
- Darwin Core (dwc)
 - <http://rs.tdwg.org/dwc/terms/index.htm>
- Numismatic Description Schema (nuds)
 - <http://nomisma.org/nuds>



Anwendungsprofile

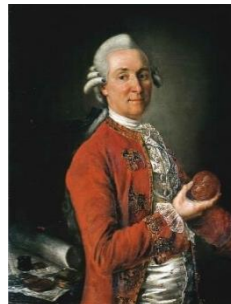
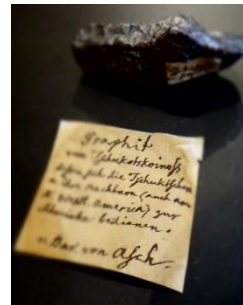
- **Ontologie**
 - definiert die relevanten Klassen und Beziehungen von Entitäten in einem bestimmten Wissensraum
- **Anwendungsprofil**
 - Ontologie, die die relevanten Klassen, Beziehungen und Eigenschaften von Entitäten in einer konkreten Anwendung definiert,
 - Nachnutzung von Termen aus vorhandenen Standards  Mixing and Matching
 - Entwicklung von eigenen Termen, die zu vorhandenen Termen in Beziehung gesetzt werden (subpropertyOf, subclassOf, sameAs)
- **Ziel:**
 - Interoperabilität mit anderen Anwendungen
 - gemeinsamer Nenner für die anwendungsübergreifende einheitliche Beschreibung von Ressourcen

Mixing and Matching – Europeana Data Model

○ dc:subject	Dublin Core Element Set	edm:currentLocation	
→ dc:title		edm:hasMet	
○ dc:type		edm:	Europeana Data Model
+ dcterms:alternative		edm:incorporates	
dcterms:conformsTo		edm:isDerivativeOf	
+ dcterms:created		+ edm:isNextInSequence	
dcterms:extent		edm:isRelatedTo	
dcterms:hasFormat		edm:isRepresentationOf	
dcterms:hasPart		edm:isSimilarTo	
dcterms:hasVersion		edm:isSuccessorOf	
Dublin Core Metadata Terms		edm:realizes	
+ dcterms:isPartOf		✓ edm:type	
dcterms:isReferencedBy		owl:sameAs	Web Ontology Language

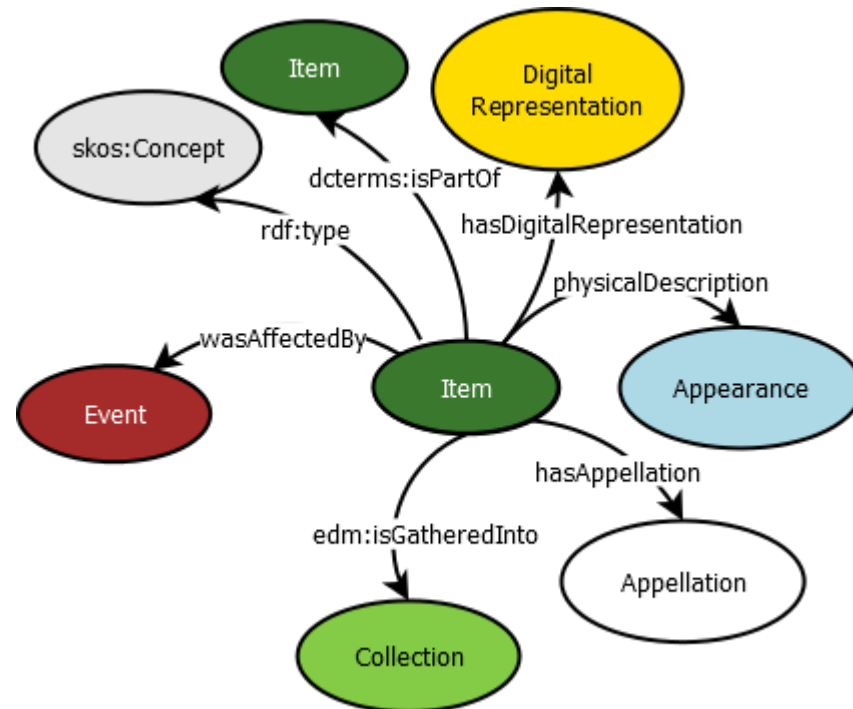
ASCH Anwendungsprofil

- Anwendungsprofile
 - Item
 - Numismatic Item
 - Organism
 - Text
 - Provenance / Event
 - Holding
 - Metadata Provenance
- KOS
 - Event Type
 - Role



ASCH Anwendungsprofil - Item

- Verwendete Standards
 - ASCH Terme
 - dcmes und dcterms
 - crm
 - rdf
 - edm
 - skos

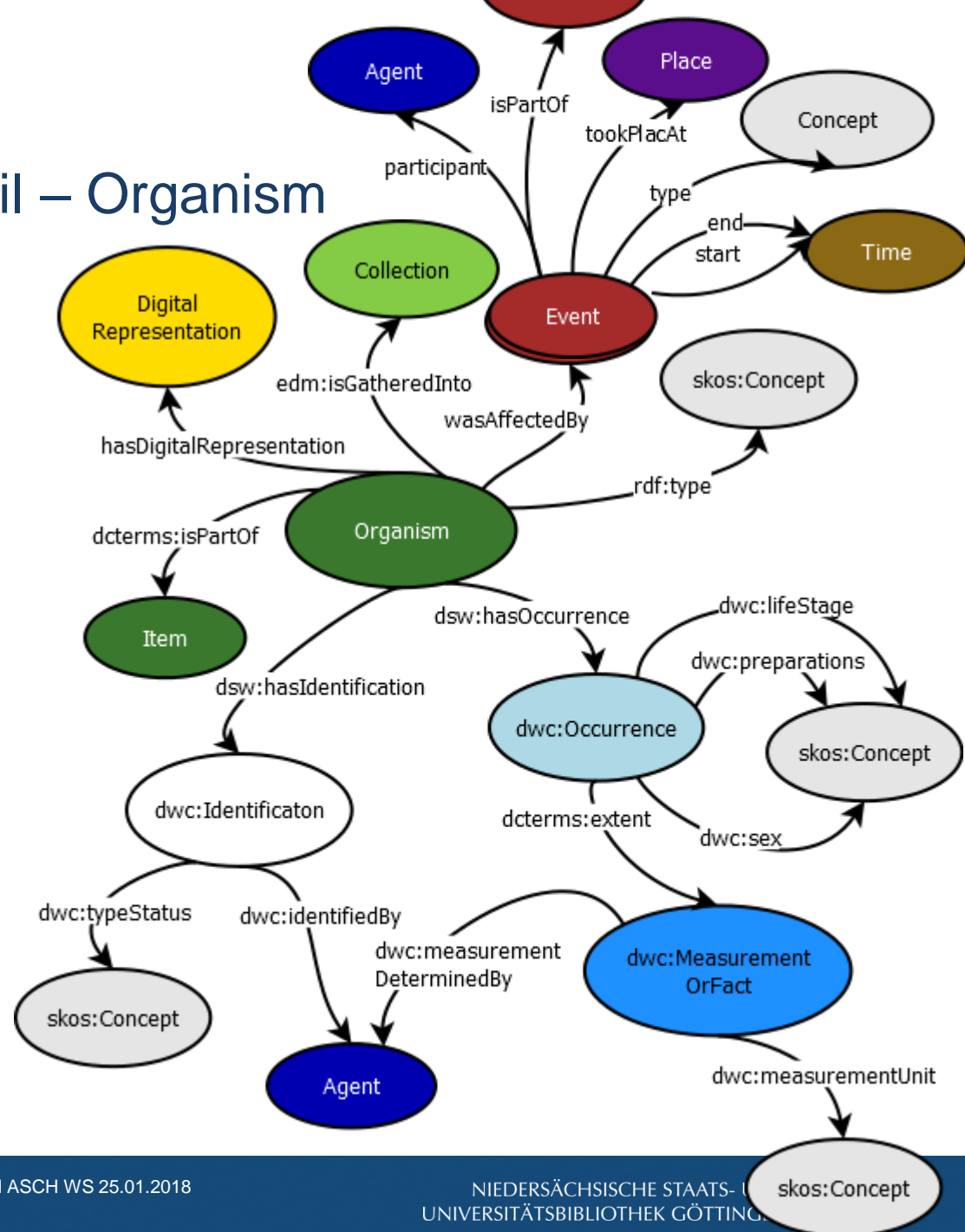


3.4 Item

```
pdo:Item a owl:Class
  rdfs:label "Item"@en , "Objekt"@de ;
  rdfs:subClassOf dcterms:PhysicalResource , prov:Entity , crm:E18_PhysicalThing ;
  rdfs:isDefinedBy <http://pdo/Item> ;
  rdfs:comment "A real world thing."@en ;
  rdfs:seeAlso ; edm:providedCHO .
```

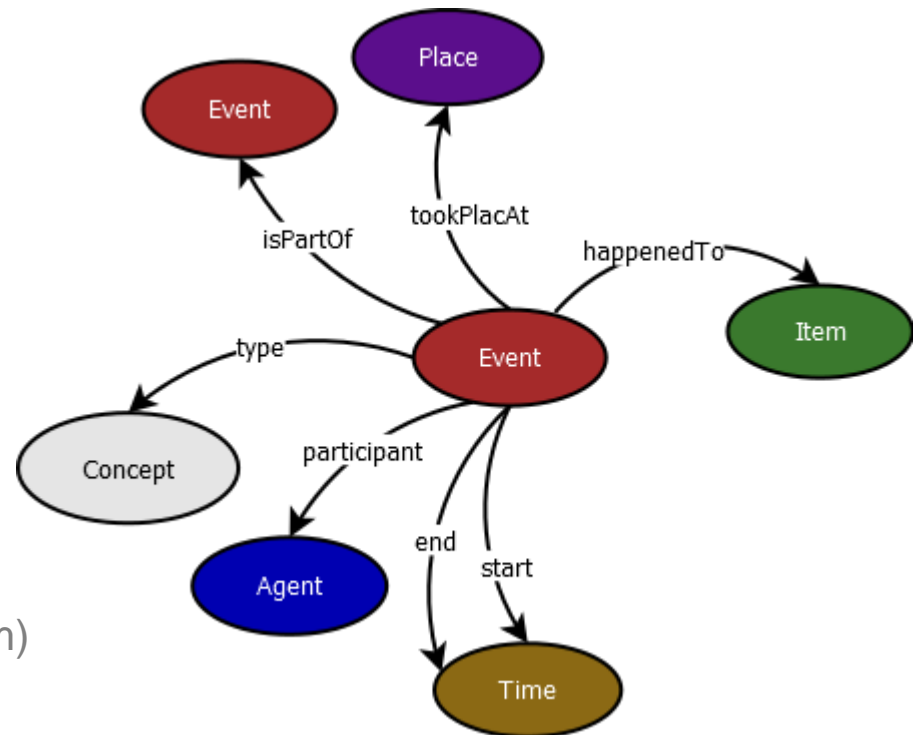
ASCH Anwendungsprofil – Organism

- Verwendete Standards
 - ASCH Terme
 - dwc
 - dcterms
 - rdf



ASCH Anwendungsprofil – Provenance / Event

- Verwendete Standards
 - ASCH Terme
 - dc und dcterms
 - crm
 - rdf und rdfs
 - foaf
 - skos
 - wgs84_pos
 - owl
 - time (= temporal reference system)



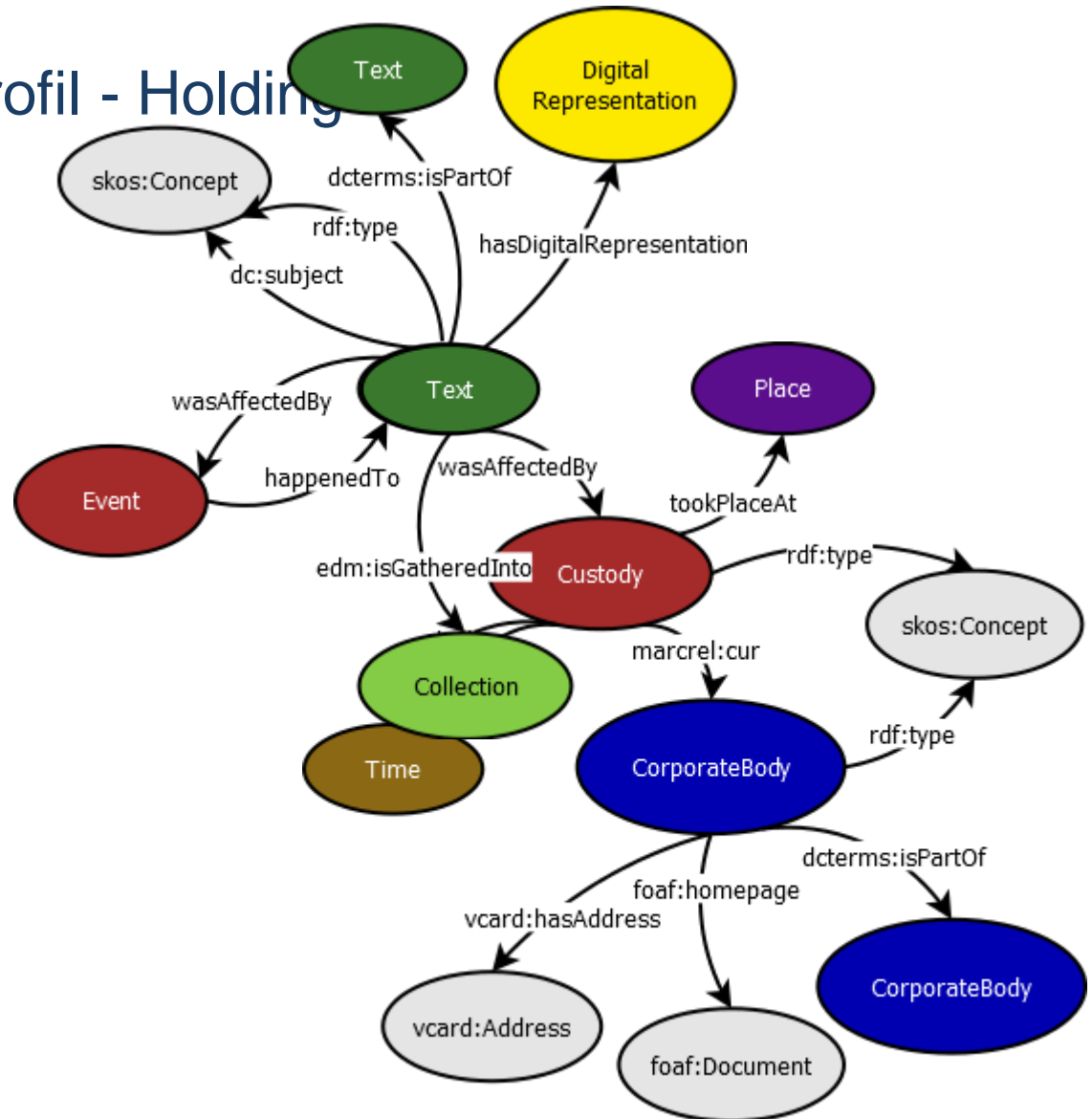
3.1 Event

```
pdo:Event a owl:Class ;  
  rdfs:label "Event"@en , "Ereignis"@de ;  
  rdfs:subClassOf crm:E5_Event ; dcmitype:Event , edm:Event , prov:Activity , dwc:Event ;  
  rdfs:isDefinedBy <http://pdo/Event> ;  
  rdfs:comment "Something that happened and affected the lifecycle of the resource."@en .
```

ASCH Anwendungsprofil - Holding

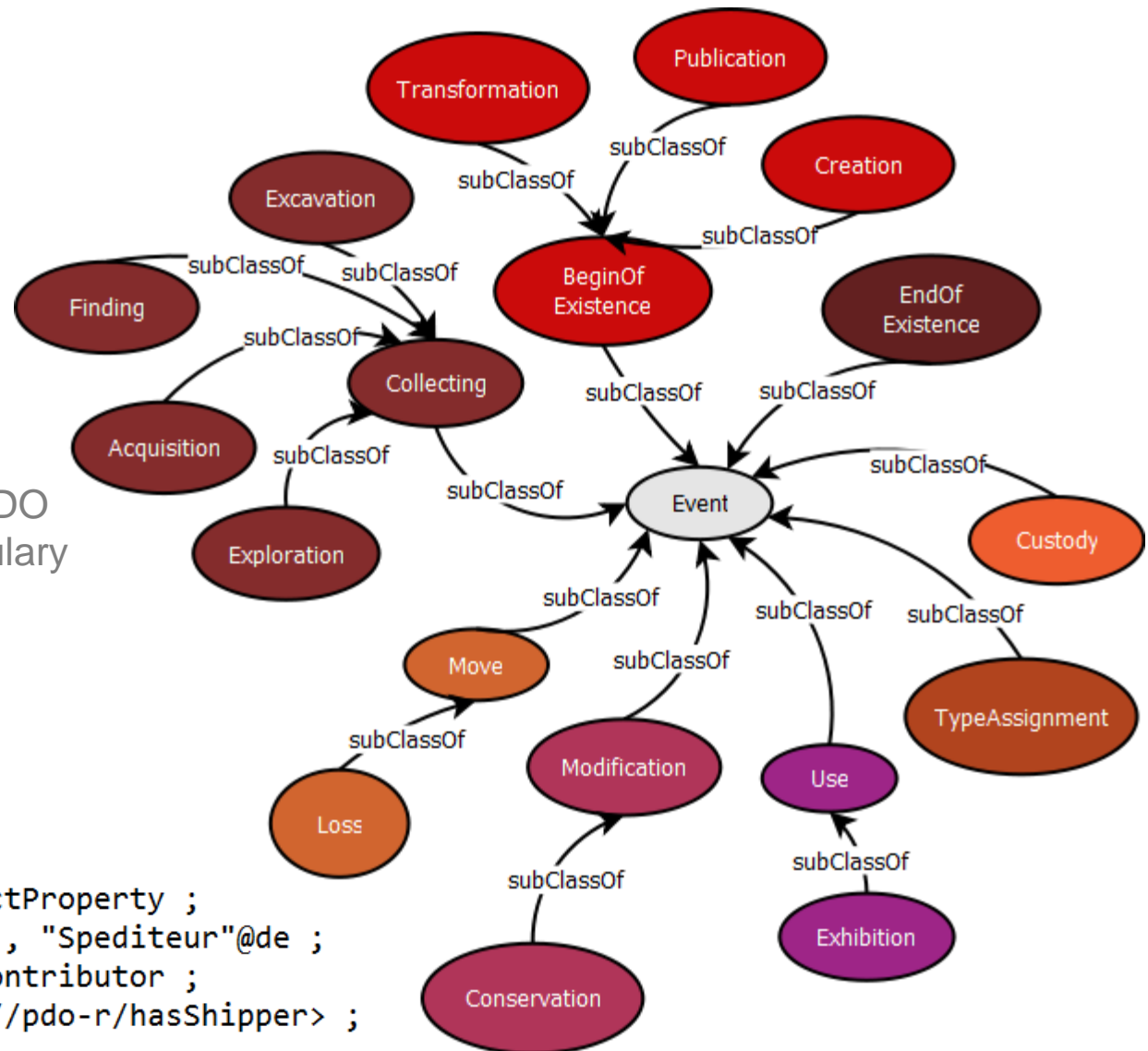
- Verwendete Standards

- ASCH Terme
- marcrel
- dc
- rdf
- vcard
- foaf
- dcterms
- rdf
- owl



ASCH „KOS“

- ASCH Event Type
 - ASCH Terme
 - crm
 - ersetzen durch LIDO Eventtype Vocabulary
- ASCH Role Type
 - ASCH Terme
 - marcel



```

pdo-r:hasShipper a owl:ObjectProperty ;
rdfs:label "shipper"@en , "Spediteur"@de ;
rdfs:subPropertyOf dc:contributor ;
rdfs:isDefinedBy <http://pdo-r/hasShipper> ;
rdfs:range pdo:Agent ;
rdfs:comment "Relates to the agent responsible for the transportation."@en ;
rdfs:seeAlso aat:300025875 .
  
```

Ergebnis

- Modell ermöglicht Zusammenspiel unterschiedlicher Objektbeschreibungen durch „andocken“ an gemeinsame Entitäten.
- Voraussetzung: die Objektbeschreibungen müssen LoD und RDF konform sein
 - Standardisierte, strukturierte Daten
 - Kontrollierte Werte mit URIs
 - Open Data
- Verwendung vorhandener Standards unterstützt die Nutzung der Daten in einem breiten Kontext

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7. Test des Datenmodells

SUB

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Vielen Dank



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